

Remarks:

Claims 1-7 are currently pending in the application. By the present amendment, claims 1 and 4 are canceled, without prejudice, and claims 2-3, and 5-6 are amended. Claims 2 and 5 have simply been rewritten in independent form and claims 3 and 6 have been amended to change their dependency.

Applicants believe the amendments made herein add no new matter. All amendments should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to be attached thereto. Reconsideration and reexamination of the application is respectfully requested in view of the amendments and the following remarks.

Rejection under 35 U.S.C. §102(b)

Claims 1-6 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 6,059,203 to Streicher. The rejection is traversed.

Independent claims 1 and 4 have been canceled from the application; therefore the rejection with respect to claims 1 and 4 is moot.

Streicher '203 discloses a valve assembly (41) including a bore (50). An elongated valve member (45) has an upper conical valve surface (46) and a lower conical valve surface (47) trapped between the upper conical valve seat (51) and the lower conical valve seat (62). When elongated valve member (45) is seated to close lower conical valve seat (62), needle control chamber (15) is exposed to fluid pressure in nozzle supply passage (17) via a high pressure communication passage (19) (that is plugged at one end by a plug 55), an upper annulus (48) and needle control passage (18). When a solenoid (24) is energized and elongated valve member (45) is moved upward to close upper conical valve seat (51), needle control chamber (15) is exposed to the always relatively low fluid pressure in fuel inlet/spill port (12) via an annular low pressure area (35), low pressure passage (37), a lower annulus (49) and needle control passage (18).

Claims 2 and 6 call for a control valve high-pressure passage having a first portion extending linearly between the annulus and the upper edge where it is positioned to communicate with the pump body high-pressure passage, and a second portion extending linearly between the

annulus and the lower edge where it is positioned to communicate with the spring cage assembly high-pressure passage wherein the first portion and second portion extend relative to each other at an angle other than 180 degrees.

Figure 2 of Streicher '203 shows the control valve high-pressure passage (17) in fluid communication with the annulus 48

through a high pressure communication passage 19. The upper portion of the control valve high-pressure passage (17) is colored green and the lower portion is colored blue. As can be clearly seen, the first portion in Streicher '203 does not extend linearly between the annulus 48 and the upper edge where it is positioned to communicate with the pump body high-pressure passage. Similarly, the second portion in Streicher '203 does not extend linearly between the annulus 48 and the lower edge where it is positioned to communicate with the spring cage assembly high-pressure passage.

Fig. 2

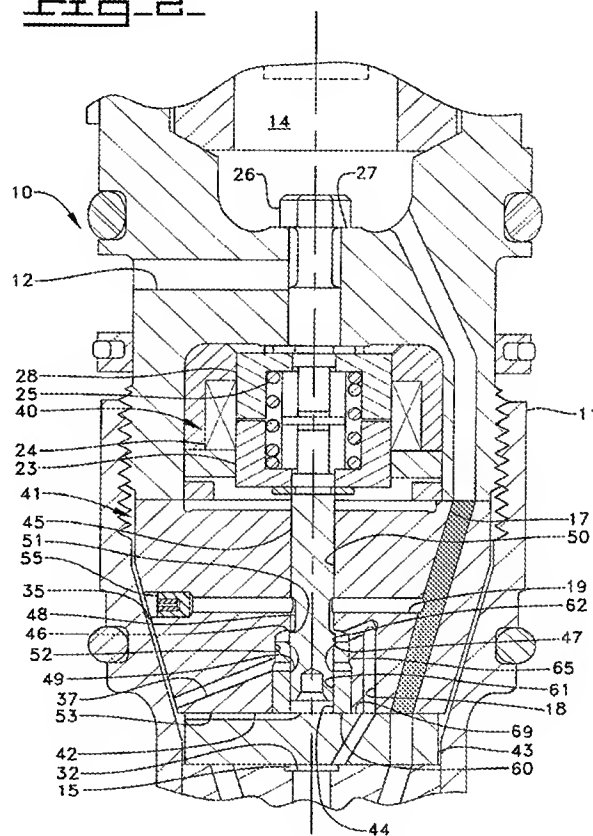


FIG. 2 OF STREICHER '203

Rather, both upper and lower portions extend linearly from their respective edges to the communication passage 19. Further, the first portion and second portions in Streicher '203 do not extend relative to each other at an angle other than 180 degrees.

Since Streicher '203 does not disclose every element of claims 2 and 6, the claims are not anticipated by Streicher '203. And since claims 3 and 5 depend from and include the same

distinctive features of claims 2 and 6, respectively, they are likewise not anticipated by Streicher '203.

Although claims 1-6 were not rejected under 35 U.S.C. §103, it cannot be said that it would have been obvious to eliminate the high pressure communication passage 19 in Streicher '203 and direct the upper and lower portions linearly from their respective edges to the annulus 48 so as to be at an angle other than 180°.

Comparing Figs. 1 and 2 of Streicher '203 to the admitted prior art in Fig. 1 of the present application, it is readily seen that there is no difference between them with respect to the patentability of claims 2 and 6 in the application. Applicant's background section describes high pressure passage 32 as extending linearly from the upper edge to the lower edge of the control valve module, just as Streicher's control valve high-pressure passage (17) does. In Applicant's prior art Fig. 1, the high pressure passage 32 communicates with an annulus 46 via a cross passage 62, just as Streicher's control valve high-pressure passage (17) is in fluid communication with the annulus (48) through the high pressure communication passage (19). In other words, Streicher '203 is cumulative to the prior art already in Applicant's Fig. 1. The problems presented by the prior art, whether Applicant's Fig. 1 or Streicher '203, are clearly set forth in the application. The solution includes the rearrangement of the conduits as claimed, accommodation for junctions (e.g., ECM processes - something not even remotely suggested by Streicher '203), and taking into account the exceedingly high pressures in the conduits prior to an injection event. It is not uncommon for pressures in a unit fuel injector as claimed to reach 2,000 bar. See, e.g., commonly owned U.S. Patent No. 7,066,151. Nothing in the prior art is offered by the Examiner to lead one of ordinary skill to the claimed solution, especially given the obstacles presented by manufacture, the uncertainties of ECM, and accounting for the extreme pressure environment of a unit fuel injector.

Moreover, the annulus 48 disclosed in Streicher '203 is defined by a reduced diameter in the elongated valve member (45), not by an enlarged cavity in the body as contemplated by the claimed invention. As well, there is a significant difference between connecting portions of the control valve high-pressure passage to the annulus through a cross passage as taught in Streicher '203 and the prior art of Applicant's Fig. 1 on the one hand, and connecting disparate high

pressure passages directly with the annulus. There is nothing in Streicher '203 or the admitted prior art that would render obvious removing the cross passage, eliminating the plug, and rerouting separate portions of the control valve high-pressure passage directly to the annulus. To say that doing so would have been obvious to one of ordinary skill is to engage in impermissible hindsight reconstruction of Applicants' claims. Thus, claims 2-3 and 5-6 are patentable over Streicher '203 and over Applicant's admitted prior art.

Moreover, the provision of extending the first and second portions directly from the annulus at an angle other than 180 degrees as required by claims 2 and 6 cannot be said to be an obvious design choice. Nothing in Streicher '203 or the admitted prior art suggests extending the first portion and second portion relative to each other at an angle other than 180 degrees. Although the control valve high-pressure passage (17) is at an angle in the injector body (11) in Streicher '203, a person of ordinary skill in the art would have no reason to rearrange the angle between the first portion and second portion in the needle control valve assembly (41) to be other than what is disclosed in Streicher '203. To say that such rearrangement would have been obvious, without more, is to engage in impermissible hindsight reconstruction of Applicants' claims. Thus, claims 2-3 and 5-6 appear to be patentable over Streicher '203.

Rejection under 35 U.S.C. §102(b) or 35 U.S.C. §103(a)

Claim 7 stands rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being unpatentable over Streicher '203. The rejection is respectfully traversed.

Independent claim 7 calls for a method of making a control valve module for a fuel injector assembly for an internal combustion engine comprising providing a metal block with a machined upper edge and a machined lower edge, machining a facing recess into the upper edge with a cylindrical chamber extending therefrom, drilling a first portion of a conduit from the upper edge to an intersection point at the cylindrical chamber, drilling a second portion of a conduit from the lower edge to the intersection point, and electro chemically machining an annulus surrounding the cylindrical chamber at the intersection point.

Streicher '203 discloses that an "[u]pper stop component (42) is machined to include nozzle supply passage (17), high pressure communication passage (19), a portion of needle control passage (18), and low pressure passage (37)." [Streicher '203, column 3 lines 19-24]. Further, Streicher '203 discloses machining the upper stop component in a single chucking to include an upper guide bore 50, a press fit locating bore 52 and upper conical valve seat 51. [Streicher '203, column 3 lines 25-35].

Streicher '203 does not anticipate claim 7 because each element in the claim is not present in Streicher '203. Streicher '203 does not disclose that the metal block has a machined upper edge and lower edge. Streicher '203 only discloses that an upper guide bore 50, a press fit locating bore 52 and upper conical valve seat 51 are machined at the same time. As such, Streicher '203 does not disclose machining a facing recess into the upper edge with a cylindrical chamber extending therefrom. Streicher '203 only discloses that the supply passage is machined. Moreover, Streicher '203 does not disclose drilling a first portion of a conduit from the upper edge to an intersection point at the cylindrical chamber and drilling a second portion of a conduit from the lower edge to the intersection point. Further, Streicher '203 does not disclose forming an annulus let alone electro chemically machining an annulus surrounding the cylindrical chamber at the intersection point. Therefore, since Streicher '203 does not these elements, claim 7 is not anticipated by Streicher '203.

Further, claim 7 is not obvious in view of Streicher '203. Applicant respectfully traverses the rejection based on Streicher '203 for failing to meet the *prima facie* requirements required under *Graham v. John Deere Co.*, 383 U.S. 1 (1966), which expressly requires resolution of the following factual inquiries: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the claimed invention and the prior art; and (3) resolving the level of ordinary skill in the art.

The rejection fails to meet the first two factual inquiries because it is based on an apparent mischaracterization of Streicher '203. As the prior art is mischaracterized, it is impossible for the first two factual inquiries to be satisfied. That is, a mischaracterization of the reference inherently renders inaccurate any determination of the scope and content of the prior art. Any subsequent comparison of the claims to the inaccurate determination of the scope and

content of the prior art will inherently lead to an incorrect determination of the differences between the claims and the prior art.

The mischaracterization of Streicher '203 arises from the Examiner's conclusion that Streicher '203 discloses "a method of making a control valve module (41) for a fuel injector assembly for an internal combustion engine comprising the steps of: providing a metal block with a machined (col. 3 ll. 17-67) upper edge and machined lower edge; machining a facing recess into the upper edge with a cylindrical chamber extending therefrom; drilling a first portion of a conduit from the upper edge to an intersection point at the cylindrical chamber; drilling a second portion of a conduit from the lower edge to the intersection point; and electro chemically machining an annulus surrounding the cylindrical chamber at the intersection point." [Office Action, page 4].

The Examiner's conclusion that the controller has all of the cited claim elements is directly contradicted by the express teaching of Streicher '203. Again, Streicher '203 does not disclose that the metal block has a machined upper edge and lower edge, Streicher '203 does not disclose machining a facing recess into the upper edge with a cylindrical chamber extending therefrom, Streicher '203 does not disclose drilling a first portion of a conduit from the upper edge to an intersection point at the cylindrical chamber and drilling a second portion of a conduit from the lower edge to the intersection point, and Streicher '203 does not disclose forming an annulus let alone electro chemically machining an annulus surrounding the cylindrical chamber at the intersection point. Given that Streicher '203 does not teach any of the five steps enumerated, the Examiner's conclusion that Streicher '203 teaches all five steps is not supportable.

Considering the teachings of Streicher '203, the enumerated steps would not have been obvious to one of ordinary skill in the art because Streicher '203 teaches a straight high-pressure passage in the control valve which could be drilled in one step. Because the two portions of the high-pressure passage in the control valve are co-linear, i.e. at 180 degrees to each other, a two step drilling process from either side to an intersection point would not be required, more costly, disfavored, and would not be obvious to one of ordinary skill in the art. Further, Streicher '203 does not teach electro chemical machining at all. Nor does Streicher teach machining an annulus

in the body, let alone electro chemically machining an annulus surrounding the cylindrical chamber at the intersection point. Electro chemically machining an annulus would not have been obvious to one skilled in the art based on such teachings in Streicher '203. Further, Streicher '203 teaches away from machining a facing recess into the upper edge with a cylindrical chamber extending therefrom in a single step because it instead discloses creating an upper guide bore 50, a press fit locating bore 52 and upper conical valve seat 51 in a single step. [Streicher '203, column 3 lines 25-35]. For these reasons, a person of ordinary skill in the art would not conclude that the invention of claim 1 would have been an obvious variation of Streicher '203. As Streicher '203 does not reach the claimed invention, claim 7 is non-obvious and therefore patentable over Streicher '203.

CONCLUSION

For the reasons discussed above, claims 2-3 and 5-7 are allowable over the prior art. If there are any remaining issues which the Examiner believes may be resolved in an interview, the Examiner is respectfully invited to contact the undersigned. Early notification of the allowability is respectfully requested.

Respectfully submitted,

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